

WHAT IS CLAIMED IS:

1. A reconfigurable scanner for scanning for ID tags containing scannable antennas oriented in multiple directions relative to the scanner, without need for physical movement of the scanner, the reconfigurable scanner comprising:

a scanning element broadcasting a signal in a selected direction, the scanning element having a plurality of variable conductive elements;

control means for electrically controlling and changing the selected direction in which the scanning element broadcasts the signal by powering and unpowering the plurality of variable conductive elements; and

transceiver means for generating an electromagnetic wave and receiving a responsive electromagnetic wave signal from a sensed ID tag within an effective range of the scanner, whereby unpowered variable conductive elements do not cause any interference with the scanning signal.

2. A reconfigurable scanner according to claim 1, wherein the plurality of variable conductive elements are a plurality of plasma loop sensors.

3. A reconfigurable scanner according to claim 2, wherein the plasma loop sensors each comprise a loop antenna having at least a portion of which is an arcuate tube section containing an ionizable gas, such that the loop antenna is only conductive when the ionizable gas is ionized.

4. A reconfigurable scanner according to claim 1, wherein the scanning element comprises an antenna and an electromagnetic shield formed by the plurality of variable conductive elements, the electromagnetic shield intersecting transmission lobes of the antenna in at least the multiple directions being scanned.

5. A reconfigurable scanner according to claim 4, wherein the plurality of variable conductive elements are mounted in an array on a substrate forming the shield.

6. A reconfigurable scanner according to claim 5, wherein the substrate is a conductive metal.

7. A reconfigurable scanner according to claim 4, wherein the electromagnetic shield is formed by stacked layers of arrays of the variable conductive elements.

8. A scanner system comprising:
a plurality of electromagnetically scannable ID tags; and

a reconfigurable scanner having a scanning element with a plurality of variable conductive elements switchable between electromagnetically active and electromagnetically invisible, control means for switching the variable conductive elements between electromagnetically active and electromagnetically invisible, and a transceiver means for generating and receiving an electromagnetic scanning signal in a direction determined by the control means, the scanning signal interacting with the scannable ID tags located in the

direction of the scanning signal.

9. A scanner system according to claim 8, wherein the variable conductive elements are plasma loop sensors.

10. A scanner system according to claim 8, wherein the scanning element comprises an antenna and an electromagnetic shield formed by the plurality of variable conductive elements, the electromagnetic shield intersecting transmission lobes of the antenna in at least the multiple directions being scanned.

11. A scanner system according to claim 10, wherein the plurality of variable conductive elements are mounted in an array on a substrate forming the shield.

12. A scanner system according to claim 11, wherein the substrate is a conductive metal.

13. A scanner system according to claim 10, wherein the electromagnetic shield is formed by stacked layers of arrays of the variable conductive elements.

14. A scanner system according to claim 8, wherein at least one of the plurality of ID tags comprise an antenna and a code connected with the antenna for detection and reading by the reconfigurable scanner.

15. A scanner system according to claim 14, wherein the at least one ID tag further comprises a power source for

powering the antenna into an active state.

16. A scanner system according to claim 15, wherein the power source is external of the ID tag.

17. A scanner system according to claim 14, wherein the antenna of the at least one ID tag is a plasma loop, and the at least one ID tag further comprises a power source for weakly or partially ionizing a plasma in the plasma loop, whereby the plasma loop remains electromagnetically invisible until external energy is received by the plasma.

18. A scanner system according to claim 17, wherein the external energy is provided by the scanning signal.

19. A scanner system for detecting the contents of a shipping container, the system comprising:

- a plurality of slots formed in the shipping container for permitting a selected bandwidth of electromagnetic wave to penetrate the shipping container;

- at least one electromagnetically scannable ID tag associated with the contents of the shipping container ; and

- a reconfigurable scanner having a scanning element with a plurality of variable conductive elements switchable between electromagnetically active and electromagnetically invisible, control means for switching the variable conductive elements between electromagnetically active and electromagnetically invisible, and a transceiver means for generating and receiving an electromagnetic scanning signal, the scanning signal having a frequency within the selected

bandwidth for penetrating the shipping container to detect the at least one ID tag.

20. A scanner system according to claim 19, wherein the shipping container comprises dielectrics on the interior of the container for damping resonant signals.

21. A scanner system according to claim 19, wherein the slots are formed by dielectric materials.

22. A scanner system according to claim 19, wherein the slots are formed by one of variable dielectric materials surrounded by conductive material and fixed dielectric materials surrounded by variable conductive material.